LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA4 | Kilburn (Brent) to Old Oak Common

Data appendix (AQ-001-004)

Air quality

November 2013

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Department for Transport

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- discussion of the policy framework (Section 2);
- baseline air quality data (Section 3);
- dust impact evaluation and risk rating (Section 4);
- air quality assessment - road traffic (Section 5); and
- air quality assessment - rail head (Section 6)

1.1.2 Maps referred to throughout the air quality appendix are contained in the Volume 5, Air Quality Map Book.

2 Policy framework

2.1.1 The London Plan[1] forms the Regional Spatial Strategy for Greater London and integrates economic, environmental, transport and social frameworks. Specifically for air quality, it seeks to achieve reductions in pollutant emissions and minimise public exposure to pollution. Policy 7.14 of the London Plan sets out a number of objectives such as minimising increased exposure to existing poor air quality, the need to reduce emissions from demolition and construction activities using best practice and the provision of on-site mitigation measures during development.

2.1.2 The Mayor's Air Quality Strategy[2] and Supplementary Planning Guidance (SPG) on Sustainable Design and Construction[3] set out actions for improving London's air quality and include measures aimed at reducing emissions from transport and new developments. A key objective of the strategy is to make better use of the planning process so that new developments do not contribute to air pollution. Policy 3 also gives support to the expansion of competitive rail-based alternatives to aviation, including the development of a national high speed rail network.

2.1.3 At the local level, all five local planning authorities in the Kilburn to Old Oak Common area have policies that seek to limit pollution levels, improve air quality and reduce emissions from development:

- the London Borough of Brent's (LBB) Core Strategy[4] Policy CP13 specifically refers to poor air quality in the North Circular Road Regeneration Area, whilst Saved Policy EP4 of the Brent Unitary Development Plan (UDP) [5] seeks to limit pollution especially where it affects air quality management areas (AQMAs);
- the City of Westminster's (CoW) Core Strategy[6] Policy CS30 seeks to reduce air pollution and minimise emissions of air pollution, whilst Westminster UDP [7] Saved Policy STRA34 seeks to improve air quality through its air quality management plan and Saved Policy ENV5 encourages development that does not increase local air pollution;
- the Royal Borough of Kensington and Chelsea's (RBKC) Core Strategy[8] Policy CO7 seeks to respect environmental limits that contribute to improving air quality; Policy CE5 seeks to prevent development that would have an unacceptable impact on amenity, unless it can be mitigated;
- the London Borough of Hammersmith and Fulham (LBHF) Core Strategy[9] Policy CC4 supports measures to protect and enhance the environmental quality of the borough, including emissions to air; and

[1] Greater London Authority (GLA) (2011), *The London Plan: Spatial Development Strategy for Greater London*, GLA, London.
[2] Greater London Authority (GLA) (2010) *Clearing the Air: The Mayor's Air Quality Strategy*, GLA, London.
[3] Greater London Authority (GLA) (2006), *Sustainable Design and Construction: The London Plan Supplementary Planning Guidance*, GLA, London.
[4] London Borough of Brent (2010) *Core Strategy*
[5] London Borough of Brent (2011) *Unitary Development Plan*
[6] City of Westminster (2011) *Core Strategy*
[7] City of Westminster (2010) *Unitary Development Plan*
[8] Royal Borough of Kensington and Chelsea (2010) *Core Strategy*
[9] London Borough of Hammersmith and Fulham (2011) *Core Strategy*

- the London Borough of Ealing (LBE) Core Strategy[10] Policy 1.1 seeks to protect and improve air quality; Policy 3.1 commits to exploring opportunities for reducing exposure to air pollution in the A40 Corridor and Park Royal; and LBE UDP[11] Saved Policy 2.6 seeks to reduce the level of air pollutants and achieve statutory limits.

2.1.4 In addition, local and regional guidance relevant to this assessment includes: LBE Draft SPG Air Quality and Pollution (2004)[12]; LBHF Local Plan and Supplementary Planning Document[13] guidance; and local air quality action plans (AQAPs).

2.1.5 Local and regional guidance relevant to the consideration of climate change adaptation and air quality is provided in the draft Climate Change Adaption Strategy for London[14].

[10] London Borough of Ealing (2012) *Core Strategy*
[11] London Borough of Ealing (2007) *Unitary Development Plan Saved Policy* 2.6.
[12] London Borough of Ealing (2004) *Draft SPG 3 Air Quality and Pollution* – approved for development control purposes.
[13] London Borough of Hammersmith and Fulham (2012) *Planning guidance supplementary planning guidance*.
[14] GLA, (2010), *Draft Climate Change Adaptation Strategy for London*, GLA, London

3 Baseline air quality data

3.1 Existing air quality

Local authority review and assessment information

3.1.1 CoW, RBKC, LBHF and LBE have all designated AQMAs covering their entire administrative areas. LBB has designated an AQMA covering much of the borough. Almost the entirety of the Kilburn (Brent) to Old Oak Common area is within designated AQMAs.

3.1.2 LBB, CoW, RBKC, LBHF and LBE all have AQAPs in place aimed at improving air quality.

Local air quality monitoring data

3.1.3 Monitoring sites within the study area that are considered relevant for this assessment are shown in Map AQ-01-004 (Volume 5, Air Quality Map Book). Table 1 to Table 3 provide a summary of the recorded pollutant concentrations at these sites.

3.1.4 The pollutant concentrations can be compared to the air quality standards:

- 40µg/m^3 as an annual mean for NO2 and PM10;
- 200µg/m^3 one-hour mean for NO2 not to be exceeded more than 18 times a year (equivalent to the 99.8th percentile of the one-hour mean);
- 50µg/m^3 24-hour mean for PM10 not to be exceeded more than 35 times a year (equivalent to the 90.4th percentile of the 24-hour mean); and
- 25µg/m^3 as an annual mean for PM2.5.

Continuous monitoring

3.1.5 This section summarises the results from the continuous monitoring sites that are considered relevant for the assessment of air quality in this study area.

Table 1: Annual mean pollutant concentrations recorded at continuous monitoring sites[15]

Pollutant	Annual mean concentrations (µg/m^3)				
	2008	2009	2010	2011	2012
LBB -Neasden Lane (521511, 185204)					
NO2	49	43	39	41	44
PM10	41	37	36	39	37
LBB -John Keble School, Harlesden (521619, 183554)					
NO2	46	56	53	45	41
PM10	24	23	26	39	23
LBB - St Mary's Primary School, Kilburn (525175, 183301)					
NO2	67	36	35	No data[16]	No data

[15] Kings College London, *www.londonair.org.uk*, Accessed: May 2013

Pollutant	Annual mean concentrations (µg/m^3)				
	2008	**2009**	**2010**	**2011**	**2012**
PM10	21	21	20	No data	No data
RBKC – Cromwell Road (526524, 178965)					
NO2	67	72	74	66	69
PM10	29	28	29	27	27
PM2.5	No data	No data[17]	16	17	15
RBKC - Earls Court (524045, 181752)					
NO2	107	107	113	100	101
PM10	37	36	34	33	35
RBKC – Kings Road (527268, 178089)					
NO2	93	93	91	91	93
RBKC - Knightsbridge (527518, 179395)					
NO2	94	90	91	81	92
RBKC - North Kensington (524045, 181752)					
NO2	33	33	37	36	36
PM10	21	21	20	23	20
PM2.5	20	14	14	16	15
RBKC - North Kensington FDMS (524045, 181752)					
PM10	20	21	21	24	20
LBHF –Shepherds Bush (523314, 179900)[18]					
NO2	No data	No data	No data	88	91
PM10	No data	No data	No data	33	39

[16] Site closed 2010
[17] PM2.5 monitoring began 2010
[18] Site opened 2011

Table 2: Number of hours when hourly mean NO2 concentrations exceed 200µg/m^3 at continuous monitoring sites[19,20]

Site	Number of exceedances of hourly mean NO2 standard				
	2008	2009	2010	2011	2012
LBB -Neasden Lane (521511, 185204)	0 (132)	3 (125)	0 (106)	2 (167)	0 (122)
LBB -John Keble School, Harlesden (521619, 183554)	1 (141)	8 (182)	12 (202)	0 (138)	0 (139)
LBB - St Mary's Primary School, Kilburn (525175, 183301)	0 (112)	4 (121)	0 (131)	No data[16]	No data
RBKC – Cromwell Road (526524, 178965)	1 (146)	3 (153)	1 (161)	4 (168)	2 (156)
RBKC - Earls Court (524045, 181752)	390 (312)	407 (300)	510 (314)	381 (310)	323 (273)
RBKC – Kings Road (527268, 178089)	120 (235)	69 (216)	63 (217)	76 (229)	74 (239)
RBKC - Knightsbridge (527518, 179395)	512 (312)	370 (332)	306 (323)	178 (265)	500 (340)
RBKC - North Kensington (524045, 181752)	0 (122)	0 (103)	0 (129)	0 (125)	1 (120)
LBHF –Shepherds Bush (523314, 179900)[18]	No data	No data	No data	3 (196)	57 (228)

Table 3: Number of days when daily mean PM10 concentrations exceed 50µg/m^3 at continuous monitoring sites[21,22]

Site	Number of exceedances of daily mean PM10 standard				
	2008	2009	2010	2011	2012
LBB -Neasden Lane (521511, 185204)	99 (71)	80 (63)	63 (65)	86 (65)	78 (64)
LBB -John Keble School, Harlesden (521619, 183554)	8 (38)	7 (35)	8 (40)	15 (41)	10 (35)
LBB - St Mary's Primary School, Kilburn (525175, 183301)[16]	10 (37)	5 (35)	2 (33)	No data	No data
RBKC – Cromwell Road (526524, 178965)	15 (44)	14 (40)	11 (44)	7 (40)	13 (45)
RBKC - Earls Court (524045, 181752)	51 (56)	42 (54)	28 (48)	41 (53)	42 (57)
RBKC - North Kensington (524045, 181752)	12 (39)	6 (32)	2 (32)	13 (39)	6 (31)
RBKC - North Kensington FDMS (524045, 181752)	7 (37)	7 (36)	3 (34)	17 (44)	12 (38)
LBHF –Shepherds Bush (523314, 179900)[18]	No data	No data	No data	3 (46)	69 (61)

Diffusion tubes

3.1.6 This section summarises the results from the diffusion tube sites that are considered relevant for the assessment of air quality in this study area.

[19] 99.8th percentile of hourly mean NO2 concentrations in brackets (µg/m^3)
[20] Kings College London, *www.londonair.org.uk*, Accessed: May 2013
[21] 90.4th percentile of daily mean PM10 concentrations in brackets (µg/m^3)
[22] Kings College London, *www.londonair.org.uk*, Accessed: May 2013

Table 4: Annual mean NO2 concentrations recorded at diffusion tube monitoring sites[23,24,25]

Site	Ordnance Survey coordinates	Annual mean NO2 concentrations (µg/m3)				
		2008	2009	2010	2011	2012
High Street, Harlesden	521743, 183361	87	77	67	71	76
27 Wells House Road	521305, 181966	43	41	43	38	36
57 - 75 Old Oak Common Lane	521557, 180996	60	53	57	55	49
39 Old Oak Lane	521587, 182684	59	52	57	56	50
101 Wells House Road	521238, 181942	38	43	37	37	No data[26]
51/53 Old Oak Common Lane	521573, 180932	61	58	56	64	49
Jenner Avenue	520724, 181552	60	49	53	50	44
6 Western Avenue	521549, 180923	73	72	80	73	69
Wulfstan Road	521984, 181132	45	42	38	35	41

Greater London Authority maps

3.1.7 Greater London Authority (GLA) maps[27] of modelled pollution concentrations provide further context on the spatial pattern of air pollution across London and indications of likely pollutant concentrations across the capital. Modelling, however, is less robust than monitoring data and may not fully take into account local characteristics that influence pollution levels.

3.1.8 GLA pollution maps estimate that annual NO2 concentrations exceed air quality objectives at or near main roads within the study area, most especially to the south of the route. The maps show no significant change in NO2 concentrations from 2008 to 2011. The maps also indicate that the Great Western Main Line railway makes a significant contribution to annual NO2 concentrations through CoW, RBKC, LBHF and LBE.

3.1.9 Annual mean PM10 concentrations have reduced marginally at all locations between 2008 and 2011 according to the GLA modelling estimates, although not along main roads such as Marylebone Road, Cromwell Road, Talgarth Road and the A406 North Circular Road, which in 2011 were still exceeding the air quality standard of 40µg/m3. The number of days on which the PM10 concentrations exceed the standard of 50µg/m3 is estimated to have fallen between 2008 and 2011, although the frequency of exceedances is higher near busy roads.

[23] London Borough of Camden (2012) Air Quality Updating and Screening Assessment
[24] City of Westminster (2011) Air Quality Progress Report
[25] City of Westminster (2010) Air Quality Progress Report
[26] Monitoring stopped 2011
[27] Greater London Authority (GLA) (2010) *London Atmospheric Emissions Inventory 2008 Concentration Maps*; http://data.london.gov.uk/laei-2008-concentration-maps; Accessed: May 2013.

3.1.10 PM2.5 exceedances across the boroughs are estimated to have decreased between 2008 and 2011 and are confined to locations along busy roads – sites that are not likely to be representative of relevant exposure locations. The Great Western Main Line railway is thought to make a significant contribution to PM2.5 exceedences concentrations along its route through CoW, RBKC, LBHF and LBE, although future plans for electrification are expected to eliminate this source.

Background pollutant concentrations

3.1.11 Estimates of background air quality were obtained from the Department for Environment, Food and Rural Affairs (Defra) maps[28]. Background NO2 concentrations are close to or exceeding air quality standards throughout the study area. Background PM10 concentrations are within air quality standards throughout the study area. NO2 annual mean concentrations were in the range 24.2µg/m^3 - 47.7µg/m^3 in 2012. PM10 annual mean concentrations were in the range 16.9µg/m^3 - 23.4µg/m^3 in 2012.

3.1.12 Defra background concentrations for the relevant assessment years were used in the Design Manual for Roads and Bridges (DMRB) [29] and ADMS-Roads assessments.

Local emission sources

3.1.13 The main source of pollution within the study area is road vehicles. Major roads include Marylebone Road, Earls Court Road and the Hanger Lane Gyratory. Other emission sources include permitted Part A[30, 31] processes at Marsh Road, Park Royal, Abbey Road, Waxlow Road, Brentfield Road, Fourth Way, Second Way and Greenford Road[32]. Due to the nature of their emissions, it is unlikely that these will have an effect on local air quality. Contributions to local pollutant concentrations made by these industrial installations are included within background concentrations used in this assessment.

3.2 Receptors

Human

Construction phase

3.2.1 Potential receptors are primarily those residential properties close to construction activity and alongside roads where traffic flows will change as a consequence of construction activity. Notable receptors close to construction activity include properties at Wells House Road, Midland Terrace, Stephenson Street, Claremont Road and Kilburn Lane. Receptors at greatest risk of dust effects are indicated in Map AQ-02-004-01 (Volume 5, Air Quality Map Book).

Operational phase

3.2.2 There are many receptors in the Kilburn (Brent) to Old Oak Common area and high densities of residential properties. Several sensitive receptors identified along the

[28] Department for Environment, Food and Rural Affairs (Defra) (2012) *Defra background maps* 2010; http://laqm.defra.gov.uk/maps/maps2010.html; Accessed: July 2013.
[29] Highways Agency, (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*
[30] *Pollution Prevention and Control Act 1999* (c.24). London, Her Majesty's Stationery Office.
[31] *The Environmental Permitting (England and Wales) Regulations 2010* (SI 210 No. 675). London, Her Majesty's Stationery Office.
[32] Environment Agency, *What's in your Backyard?*; http://www.environment-agency.gov.uk/wiyby; Accessed: August 2013.

route of the Proposed Scheme include Harlesden Primary School, Furness Primary School, John Perryn Primary School, Old Oak Primary School and John Keble Anglican Church Primary School.

Ecological

Construction phase

3.2.3 The Wormwood Scrubs local nature reserve (LNR) is located to the south of Old Oak Common and borders the Old Oak Common construction site. It is potentially at risk of dust impacts during construction of the Proposed Scheme.

Operational phase

3.2.4 No ecological receptors in the Kilburn to Old Oak Common area are considered likely to be affected by air quality as a result of the operational phase

4 Dust impact evaluation and risk rating

4.1.1 The following sections provide details of the assessment of construction impacts following the Institute of Air Quality Management (IAQM) guidance[33]. Where considered useful to identify receptors and their relationship to the construction activity, a specific figure is provided and referenced. On-site haul movements were assessed explicitly.

4.1.2 The dust assessment criteria for the haul route are based on those for earthworks, as set out in the IAQM guidance. This emission phase was considered to be the most applicable, as the assessment of impacts from earthworks will depend, in part, on the passage of vehicles over open surfaces. It was assumed that significant effects would not occur beyond a distance of 50m from the haul route, again based on interpretation of the earthworks criteria, and that all areas of the haul route will be subject to more than 10 vehicle movements per day. On the basis of criteria for earthworks within the IAQM guidance, the dust emission class for the haul route is large. Wherever there are receptors within 50m of a haul route, the sensitivity of the receiving environment was derived using the IAQM guidance. The need for, and capability of, the local environmental management plan (LEMP) to control these dust emissions, as directed by the draft Code of Construction Practice[34] (CoCP), was then considered in forming the conclusion of the assessment.

Table 5: Evaluation and risk rating of construction activities

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
Salusbury Road vent shaft (Map AQ-02-004-01, Figure 4.1 (Volume 5, Air Quality Map Book))						
Demolition	Less than 20m	Small	Medium	High	Negligible	1. Less than20,000m^3 waste generated during demolition Potentially dusty construction material 2. Densely populated area, 10-100 dwellings within 20m of site
Earthworks	Less than 20m	Medium	High	High	Slight adverse	1. Potentially dusty soil type 2. Densely populated area, 10-100 dwellings within 20m of site

[33] Institute of Air Quality Management (IAQM), (2011), *Guidance on the assessment of the impacts of construction on air quality and the determination of their significance*
[34] Volume 5: Appendix CT-003-000

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
Construction	Less than 20m	Medium	High	High	Slight adverse	1. Potentially dusty construction material (ready-mix concrete) 2. Densely populated area, 10-100 dwellings within 20m of site
Trackout	Less than 20m	Large	High	High	Slight adverse	1. More than 100 HGV trips per day 2. Densely populated area, 10-100 dwellings within 20m of site
Old Oak Common (Map AQ-02-004-01, Figure 4.3 (Volume 5, Air Quality Map Book))						
Demolition	20-100m	Large	High	High	Slight adverse	1. More than 50,000m^3 waste generated during demolition 2. Densely populated area, 10-100 dwellings within 20m of site
Earthworks	Less than 20m	Large	High	High	Slight adverse	1. Area greater than 10,000m^2 involved in earthworks 2. Densely populated area, 10-100 dwellings within 20m of site
Construction	Less than 20m	Large	High	High	Slight adverse	1. On-site concrete batching, piling, use of dusty construction materials Greater than 100,000m^3 building material volume 2. Densely populated area, 10-100 dwellings within 20m of site
Trackout	Less than 20m	Medium	Medium	High	Negligible	1. Fewer than 40 heavy goods vehicles (HGVs) per day 2. Densely populated area, 10-100 dwellings within 20m of site
Haul routes	20-50m	Large	High	High	Slight adverse	1. Area greater than 10,000m^2 Potentially dusty soil type

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
						2. Densely populated area, PM10 concentrations close to the air quality standards (40 µg/m^3)
Victoria Road and Chase Road tunnel drive site (Map AQ-02-004-01, Figure 4.3 and Figure 4.4 (Volume 5, Air Quality Map Book))						
Demolition	20-100m	Large	High	Low	Negligible	1. More than 50,000m^3 waste generated during demolition 2. No receptors within 20m of activities
Earthworks	N/A	N/A	N/A	N/A	N/A	1. No earthworks on site
Construction	200-350m	Small	Negligible	Low	Negligible	1. Assumed less than 25,000m^3 building material volume 2. No receptors within 20m of activities
Trackout	20-50m	Small	Low	Low	Negligible	1. Assumed fewer than 25 HGV trips per day, as primary transport mode will be via conveyor then railway. 2. No receptors within 20m of activities
Haul route	Less than 20m	Large	High	High	Slight adverse	1. Area greater than 10,000m2 Potentially dusty soil type 2. Densely populated area, 10-100 dwellings within 20m of site
Makro Atlas/ Willesden Euroterminal (Map AQ-02-004-02, Figure 4.5, (Volume 5, Air Quality Map Book))						
Demolition	20-100m	Small	Low	Low	Negligible	1. Less than20,000m^3 waste generated during demolition Material with low dust release potential 2. No receptors within 20m of site

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
Earthworks	N/A	N/A	N/A	N/A	N/A	1. No earthworks on site
Construction	200-350m	Medium	Low	Low	Negligible	1. Less than 25,000m^3 building material volume On-site concrete batching (segment casting facility) 2. No receptors within 20m of activities
Trackout	Less than 20m	Small	Medium	High	Negligible	1. Assumed fewer than 25 HGV trips per day Primary transport mode will be via conveyor then railway. 2. Densely populated area, 10-100 dwellings within 20m of track out
Haul route	Less than 20m	Large	High	High	Slight adverse	1. Site area greater than 10,000m^2 Potentially dusty soil type 2. Densely populated area, 10-100 dwellings within 20m of site
Wormwood Scrubs local nature reserve (Map AQ-02-004-01, Figure 4.2 (Volume 5, Air Quality Map Book))						
Demolition	More than 100m	Medium	Low	Medium	Negligible	1. Assumed less than 20,000m^3 waste generated during demolition Potentially dusty construction material 2. Locally designated ecological site
Earthworks	N/A	N/A	N/A	N/A	N/A	No earthworks near site
Construction	Less than 20m	Medium	Medium	Medium	Negligible	1. Potentially dusty construction materials 2. Locally designated ecological

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
						site
Trackout	Less than 20m	Large	High	Medium	Negligible	1. More than 100 HGV trips per day 2. Locally designated ecological site

Table 6: Summary of construction dust impacts and effects

Location	Magnitude of impact	Effect of dust-generating activities	Additional mitigation
Salusbury Road vent shaft	Slight adverse	Not significant	None required
Old Oak Common site	Slight adverse	Not significant	None required
Victoria Road and Chase Road tunnel drive site	Negligible	Not significant	None required
Makro Atlas /Willesden Euroterminal	Slight adverse	Not significant	None required
Wormwood Scrubs local nature reserve	Negligible	Not significant	None required

5 Air quality assessment - road traffic

5.1 Overall assessment approach

5.1.1 The air quality assessment for road-related emissions has considered the use of three different approaches based on the scale of changes in traffic and road alignment. Where the Design Manual for Roads and Bridges[35] (DMRB) thresholds detailed in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1) are not exceeded, no additional assessment is required, as the air quality impacts will be minimal. If these thresholds are breached then a quantitative assessment has been carried out

5.1.2 Where the road configuration is straightforward, the DMRB screening method has been used to predict changes in air quality. Where the road layout is considered to be complex or where the use of the DMRB screening method indicated that there will be a potential exceedance of air quality standards, the atmospheric dispersion model ADMS-Roads has been used for the assessment. Professional judgment has been used to select the appropriate tool for each area.

5.1.3 In this study area both the DMRB screening method and the ADMS-Roads model were used for the assessment.

Assessing congestion

5.1.4 To assess the impact of congestion on the DMRB assessment, an additional DMRB assessment was carried out that modelled congested situations. This assumed a speed of 10kph in all scenarios for all links where the speed in the traffic model exceeded 10kph, in order to identify locations where queuing traffic might give rise to higher concentrations and require further assessment. The results of this additional assessment are presented alongside the main results.

5.1.5 For the ADMS-Roads modelling, queues were assumed to occur on roads with an average speed of less than 50% of the speed limit. Queue speeds of 5km/h were assumed. A queue length of 25-50m was assumed, depending on the speed on the road[36]. In the absence of information on the occurrence of queuing, it was assumed that queuing occurred between 7am and 7pm.

5.2 Model inputs and verification

Model parameters for detailed assessment

5.2.1 The ADMS-Roads model was used for the detailed assessment. A surface roughness length of 1.5m, surface roughness at meteorological site of 0.2m, minimum Monin Obukhov length of 100m and latitude of 51.5 degrees were used in the detailed assessment. All other model parameters were model default settings. Meteorological data from the London Heathrow monitoring site was used.

[35] Highways Agency, (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*
[36] Queue length (in metres) was calculated using the following formula: l = 50 -((v/0.5vl) x 25), where l = queue length, v = road speed, vl = speed limit

Model verification

5.2.2 Since the model predicts nitrogen oxide (NOx) contributions for the modelled roads, this was initially compared to the NOx road contribution derived from NOx concentrations (where available) measured at monitoring sites and Defra background maps.

5.2.3 Roadside monitoring sites were chosen from across the traffic model area, which extends west of the study area. This allowed a greater number of sites to be included in the verification. Sites where nearby busy roads were not included in the traffic model data set (and which, therefore, could not be modelled correctly as roadside sites with the traffic data set) or where monitored road NOx was found to be negative were excluded from assessment. The results of this comparison are shown in Table 7.

Table 7: Comparison of monitored and modelled NOx concentrations for verification

Site	Ordnance Survey co-ordinates	Monitored total NO2	Monitored total NOx	Background NO2	Background NOx	Monitored road NOx	Modelled road NOx	Monitored /modelled road NOx
LBB - Ikea (AURN)	520866, 185169	76.0	257.4	31.5	56.0	201.4	44.7	4.5
LBB - John Keble Primary School	521619, 183554	41.1	86.7	35.7	67.0	19.7	14.9	1.3
LBE - Hanger Lane Gyratory (AURN)	518537, 182708	95.0	324.6	37.1	69.2	255.4	36.2	7.1
LBE - Western Avenue (AURN)	520430, 181950	73.3	184.8	38.6	74.6	110.2	35.4	3.1
LBHi - South Ruislip (AURN)	510835, 184916	52.1	111.7	26.5	43.7	68.0	12.2	5.6
LBHi - Oxford Avenue (AURN)	509551, 176974	44.1	78.4	36.2	69.2	9.2	3.3	2.8
LBHa - Pinner Road (AURN)	513504, 188998	46.8	110.4	24.0	39.1	71.3	6.3	11.3
RBKC - Cromwell	526524, 178965	69.1	155.9	43.8	82.4	73.5	11.4	6.5

Site	Ordnance Survey co-ordinates	Monitored total NO2	Monitored total NOx	Background NO2	Background NOx	Monitored road NOx	Modelled road NOx	Monitored /modelled road NOx
Road (AURN)								
RBKC - Knightsbridge (AURN)	527518, 179395	92.3	229.2	46.2	87.4	141.8	21.3	6.7
RBKC - Kings Road (AURN)	527268, 178089	92.6	224.3	43.8	82.8	141.4	15.8	9.0
LBB - junction of Kingsbury Road and Edgware Road	521447, 188730	54.0	N/A	28.8	49.6	49.9	16.1	3.1
LBB - junction of North Circular Road and Chartley Avenue	521222, 186122	93.0	N/A	33.7	60.3	175.2	47.8	3.7
LBB - junction of Dudden Hill Lane and High Road	522191, 184821	60.0	N/A	31.9	56.8	59.4	33.5	1.8
LBB - junction of Dollis Hill Lane and Edgware Road	523192, 186570	76.0	N/A	31.8	56.4	114.3	23.4	4.9
LBB - Chichele Road, near Anson Road	523692, 185372	65.0	N/A	31.8	56.4	75.8	15.3	5.0
LBB - High Street, Harlesden	521743, 183361	76.0	N/A	35.7	67.0	100.5	33.9	3.0
LBB - Kilburn Bridge	525461, 183558	101.0	N/A	36.6	68.5	196.5	20.2	9.7
LBE - Horn Lane AQMS (co-located	520432, 181428	52.0	N/A	38.6	74.6	16.7	13.6	1.2

Site	Ordnance Survey co-ordinates	Monitored total NO2	Monitored total NOx	Background NO2	Background NOx	Monitored road NOx	Modelled road NOx	Monitored /modelled road NOx
triplicate)								
LBE - 326 Western Avenue	520424, 181957	59.0	N/A	38.6	74.6	35.9	33.0	1.1
LBE - 57 - 75 Old Oak Common Lane	521557, 180996	49.0	N/A	36.1	66.9	17.1	15.0	1.1
LBE - 39 Old Oak Lane	521587, 182684	50.0	N/A	36.2	69.4	17.0	13.0	1.3
LBE - 5 Leamington Park	520532, 181517	46.0	N/A	38.6	74.6	1.8	19.2	0.1
LBHF - Westway	522548, 180960	77.0	N/A	36.9	66.7	104.5	38.1	2.7
LBHF - Hammersmith Broadway	523327, 178484	77.0	N/A	45.5	86.3	80.0	29.8	2.7
LBHF - Talgarth Road	524150, 178363	56.0	N/A	43.7	82.2	19.3	34.9	0.6
LBHF - Uxbridge Road	522861, 180061	43.0	N/A	36.9	66.7	2.6	8.0	0.3
RBKC - Earls Court Station	525548, 178556	101.0	N/A	45.7	87.1	171.1	40.3	4.2
RBKC - Chatsworth Court	525263, 178936	51.0	N/A	45.7	87.1	1.3	10.2	0.1
RBKC - Sloane Square	528011, 178675	81.0	N/A	45.2	85.0	95.8	19.7	4.9
RBKC - Chelsea Physic Garden (Gate)	527726, 177727	59.0	N/A	40.0	72.8	37.9	14.6	2.6
RBKC - Sloane	527411,	56.0	N/A	43.8	82.8	18.7	8.0	2.3

Site	Ordnance Survey co-ordinates	Monitored total NO2	Monitored total NOx	Background NO2	Background NOx	Monitored road NOx	Modelled road NOx	Monitored /modelled road NOx
Avenue	178659							
RBKC - Cromwell Road (Natural History Museum)	526550, 178968	70.0	N/A	43.8	82.4	60.9	8.3	7.4
RBKC - junction of Pavillion Street and Sloane Avenue	527889, 179145	54.0	N/A	46.2	87.4	8.7	11.1	0.8
RBKC - junction of Kensington High Street and Kensington Church Street	525630, 179674	62.0	N/A	43.8	83.2	35.1	18.2	1.9
RBKC - junction of Fulham Road and Limerston Street	526377, 177867	55.0	N/A	43.1	80.6	18.4	10.9	1.7
RBKC - Warwick Road	524825, 178902	50.0	N/A	43.7	82.2	3.9	13.6	0.3
RBKC - Ladbroke Grove / North Kensington Library	524342, 181271	53.0	N/A	43.3	83.3	10.3	27.0	0.4
RBKC - junction of Cromwell Road and Earls Court Road	525355, 178841	84.0	N/A	45.7	87.1	104.3	46.0	2.3

5.2.4 The calculated model adjustment factor for the road contribution of NOx was 3.4. This was applied to all NOx results from the ADMS-Roads modelling. This is in accordance with Defra guidance[37] on model verification.

5.2.5 A final check was then made to compare the total NO2 concentrations from the modelling to the monitored data. This is shown in Table 8.

Table 8: Comparison of monitored and modelled annual average NO2 concentrations

Site	Monitored concentration (µg/m^3)	Modelled concentration (µg/m^3)	Difference ((modelled - monitored)/monitored) x 100
LBB - Ikea (AURN)	76.0	81.2	7%
LBB - John Keble Primary School	41.1	55.5	35%
LBE - Hanger Lane Gyratory (AURN)	95.0	78.1	-18%
LBE - Western Avenue (AURN)	73.3	78.6	7%
LBHi - South Ruislip (AURN)	52.1	44.1	-15%
LBHi - Oxford Avenue (AURN)	44.1	41.0	-7%
LBHa - Pinner Road (AURN)	46.8	33.8	-28%
RBKC - Cromwell Road (AURN)	69.1	58.6	-15%
RBKC - Knightsbridge (AURN)	92.3	71.4	-23%
RBKC - Kings Road (AURN)	92.6	63.6	-31%
LBB - junction of Kingsbury Road and Edgware Road	54.0	51.0	-6%
LBB - junction of North Circular Road and Chartley Avenue	93.0	85.6	-8%
LBB - junction of Dudden Hill Lane and High Road	60.0	71.4	19%
LBB - junction of Dollis Hill Lane and Edgware Road	76.0	61.4	-19%
LBB - Chichele Road, near Anson Road	65.0	52.5	-19%
LBB - High Street, Harlesden	76.0	74.9	-1%
LBB - Kilburn Bridge	101.0	62.1	-38%
LBE - Horn Lane AQMS (co-located triplicate)	52.0	56.6	9%

[37] Department for Environment, Food and Rural Affairs (2009) *Technical Guidance Note LAQM TG(09)*

Site	Monitored concentration (µg/m^3)	Modelled concentration (µg/m^3)	Difference ((modelled - monitored)/monitored) x 100
LBE - 326 Western Avenue	59.0	76.4	30%
LBE - 57 - 75 Old Oak Common Lane	49.0	56.0	14%
LBE - 39 Old Oak Lane	50.0	53.8	8%
LBE - 5 Leamington Park	46.0	62.8	36%
LBHF - Westway	77.0	79.7	3%
LBHF - Hammersmith Broadway	77.0	79.0	3%
LBHF - Talgarth Road	56.0	82.2	47%
LBHF - Uxbridge Road	43.0	48.2	12%
RBKC - Earls Court Station	101.0	88.6	-12%
RBKC - Chatsworth Court	51.0	58.9	15%
RBKC - Sloane Square	81.0	69.0	-15%
RBKC - Chelsea Physic Garden (Gate)	59.0	58.9	0%
RBKC - Sloane Avenue	56.0	54.6	-2%
RBKC - Cromwell Road (Natural History Museum)	70.0	54.9	-22%
RBKC - junction of Pavillion Street and Sloane Avenue	54.0	60.4	12%
RBKC - junction of Kensington High Street and Kensington Church Street	62.0	66.2	7%
RBKC - junction of Fulham Road and Limerston St	55.0	57.3	4%
RBKC - Warwick Road	50.0	61.1	22%
RBKC - Ladbroke Grove / North Kensington Library	53.0	74.5	41%
RBKC - junction of Cromwell Road and Earls Court Road	84.0	93.4	11%

5.2.6 As the majority of modelled NO2 concentrations were within 25% of the monitored concentrations, no further adjustment was undertaken.

5.3 Construction traffic model

5.3.1 Roads assessed for construction traffic are detailed in Volume 5: Appendix TR-001-000. Scenarios assessed correspond to two peak phases of construction:

- test 1, representing construction traffic movements in January 2018 of the construction programme; and
- test 2, representing construction traffic movements in April to June 2024 of the construction programme.

5.3.2 Along the eastern border of the study area, scenarios assessed correspond to three peak phases of construction associated with Euston Station:

- test 1 (Euston), representing 2017;
- test 2 (Euston), representing 2019; and
- test 3 (Euston), representing 2021.

Receptors assessed

5.3.3 For all road links where DMRB criteria for assessing local air quality were met due to increased traffic flows, a number of receptors representative of worst-case exposure locations were selected for assessment. These included locations representative of highest pollutant concentrations along the roads, including closest to junctions or to the road itself.

5.3.4 All receptors where DMRB screening identified a likely moderate adverse or substantial adverse impact were also modelled within ADMS-Roads. Additional receptors close to DMRB receptors were added for the ADMS-Roads assessment, in order to ensure that worst-case exposure locations were captured. This included the addition of a number of receptors in the study area that were near to receptors in the Euston - Station and Approach area where the DMRB assessment for that study area identified a likely moderate adverse or substantial adverse impact.

5.3.5 Receptors assessed are presented in Table 9and in Map AQ-01-004 (Volume 5, Air Quality Map Book).

Table 9: Modelled receptors (construction phase)

Receptor	Description/location	Ordnance Survey coordinates	Scenarios assessed with the Proposed Scheme	
			DMRB assessment	ADMS-Roads assessment
4-1	College Park Court 1, Scrubs Lane	522378, 182936	Test 2	-
4-2	203 High Street	522116, 183088	Test 2	-
4-3	262 Lavender Hill	527434, 175480	Test 2	-
4-4	245 Wulfstan Street	521521, 181541	Test 2	-
4-5	22A Wood Lane	523107, 181301	Test 2	-
4-6	63 Wells House Road	521296, 181890	Test 1, test 2	-

Receptor	Description/location	Ordnance Survey coordinates	Scenarios assessed with the Proposed Scheme	
			DMRB assessment	ADMS-Roads assessment
4-7	50 Old Oak Lane	521569, 182686	Test 2	-
4-8	Station Offices, Station Road	521706, 183024	Test 2	-
4-9	1-3 Erconwald Street	521566, 181076	Test 2	-
4-10	3 Victor Road	522631, 182994	Test 2	-
4-11	1 Wulfstan Street	521985, 181093	Test 2	-
4-12	2 Victoria Terrace	521445, 182474	Test 1, test 2	-
4-13	63A-63C Station Road	521726, 183021	Test 2	-
4-14	4 Manor Parade	521611, 183312	Test 2	-
4-15	2A St. John's Hill	527361, 175459	Test 2	-
4-16	84 Shaftesbury Gardens	521415, 182456	Test 1, test 2	Test 1, test 2
4-17	Cabin Cafe, Scrubs Lane	522497, 182416	Test 2	-
4-18	Holbrook House, Victoria Road	520926, 181878	Test 1, test 2	-
4-19	116 Wales Farm Road	520887, 181753	Test 1, test 2	Test 1, test 2
4-20	5 Portal Way	520585, 181712	Test 1, test 2	-
4-21	3 Portal Way	520664, 181524	Test 1, test 2	-
4-22	133 Barnet Lane	520745, 195296	Test 2	-
4-23	2 Wells House Road	521287, 181987	Test 1, test 2	-
4-24	174A Lavender Hill	527785, 175560	Test 2	-
4-41	Burlington Danes School, Wood Lane	523014, 181514	-	Test 2
4-42	235A Scrubs Lane	523026, 181633	-	Test 2
4-43	1B Woodmans Mews	523009, 181566	-	Test 2
4-44	235 Scrubs Lane	522985, 181685	-	Test 2
4-45	The Production Offices, Old Oak Lane	521471, 182511	-	Test 1, test 2
4-46	76 Shaftesbury Gardens	521374, 182423	-	Test 1, test 2
4-47	98 Shaftesbury Gardens	521434, 182423	-	Test 1, test 2
4-48	3 Shaftesbury Gardens	521312, 182366	-	Test 1, test 2
4-49	4 Midland Terrace	521258, 182284	-	Test 1, test 2
4-50	152 Victoria Road	520875, 181851	-	Test 1, test 2
4-51	Ebbett Court, Victoria Road	520789, 181888	-	Test 1, test 2
4-52	Poulton Court, Victoria Road	520767, 181832	-	Test 1, test 2
4-53	1 Park Royal Road	520594, 181830	-	Test 1, test 2
4-54	Trentham Court, Victoria Road	520701, 181874	-	Test 1, test 2

Receptor	Description/location	Ordnance Survey coordinates	Scenarios assessed with the Proposed Scheme	
			DMRB assessment	ADMS-Roads assessment
4-55	96 Wales Farm Road	520839, 181701	-	Test 1, test 2
4-65	Cunningham Court, Edgware Road	526552, 182213	-	Test 2 (Euston), test 3 (Euston)
4-66	453 Edgware Road	526573, 182198	-	Test 2 (Euston), test 3 (Euston)
4-67	379 Edgware Road	526763, 182005	-	Test 2 (Euston), test 3 (Euston)
4-68	283 Edgware Road	526964, 181798	-	Test 2 (Euston), test 3 (Euston)

Background concentrations

5.3.6 The background concentrations used in the DMRB and ADMS-Roads assessments are shown in Table 10 and Table 11 taken from the Defra maps[28].

Table 10: Background 2012 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-1) College Park Court 1, Scrubs Lane	62.6	34.8	20.2
(4-2) 203 High Street	58.9	32.6	19.8
(4-3) 262 Lavender Hill	69.7	38.8	21.7
(4-4) 245 Wulfstan Street	60.9	34.0	19.6
(4-5) 22A Wood Lane	80.0	42.4	23.1
(4-6) 63 Wells House Road	60.9	34.0	19.6
(4-7) 50 Old Oak Lane	69.4	36.2	20.4
(4-8) Station Offices, Station Road	67.0	35.7	21.1
(4-9) 1-3 Erconwald Street	60.9	34.0	19.6
(4-10) 3 Victor Road	62.6	34.8	20.2
(4-11) 1 Wulfstan Street	60.9	34.0	19.6
(4-12) 2 Victoria Terrace	69.4	36.2	20.4
(4-13) 63A-63C Station Road	67.0	35.7	21.1
(4-14) 4 Manor Parade	67.0	35.7	21.1
(4-15) 2A St. John'S Hill	69.7	38.8	21.7
(4-16) 84 Shaftesbury Gardens	69.4	36.2	20.4
(4-17) Cabin Cafe, Scrubs Lane	62.6	34.8	20.2

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-18) Holbrook House, Victoria Road	74.6	38.6	22.3
(4-19) 116 Wales Farm Road	74.6	38.6	22.3
(4-20) 5 Portal Way	74.6	38.6	22.3
(4-21) 3 Portal Way	74.6	38.6	22.3
(4-22) 133 Barnet Lane	36.5	22.5	17.5
(4-23) 2 Wells House Road	60.9	34.0	19.6
(4-24) 174A Lavender Hill	69.7	38.8	21.7
(4-41) Burlington Danes School, Wood Lane	80.0	42.4	23.1
(4-42) 235A Scrubs Lane	80.0	42.4	23.1
(4-43) 1B Woodmans Mews	80.0	42.4	23.1
(4-44) 235 Scrubs Lane	59.2	33.6	19.8
(4-45) The Production Offices, Old Oak Lane	69.4	36.2	20.4
(4-46) 76 Shaftesbury Gardens	69.4	36.2	20.4
(4-47) 98 Shaftesbury Gardens	69.4	36.2	20.4
(4-48) 3 Shaftesbury Gardens	69.4	36.2	20.4
(4-49) 4 Midland Terrace	69.4	36.2	20.4
(4-50) 152 Victoria Road	74.6	38.6	22.3
(4-51) Ebbett Court, Victoria Road	74.6	38.6	22.3
(4-52) Poulton Court, Victoria Road	74.6	38.6	22.3
(4-53) 1 Park Royal Road	74.6	38.6	22.3
(4-54) Trentham Court, Victoria Road	74.6	38.6	22.3
(4-55) 96 Wales Farm Road	74.6	38.6	22.3
(4-65) Cunningham Court, Edgware Road	72.4	39.1	21.4
(4-66) 453 Edgware Road	72.4	39.1	21.4
(4-67) 379 Edgware Road	72.4	39.1	21.4
(4-68) 283 Edgware Road	93.3	47.7	23.3

Table 11: Background 2017 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-1) College Park Court 1, Scrubs Lane	51.8	30.1	19.0
(4-2) 203 High Street	48.1	28.0	18.6

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-3) 262 Lavender Hill	56.2	32.8	20.5
(4-4) 245 Wulfstan Street	49.8	29.1	18.4
(4-5) 22A Wood Lane	62.8	35.1	21.7
(4-6) 63 Wells House Road	49.8	29.1	18.4
(4-7) 50 Old Oak Lane	57.9	31.8	19.1
(4-8) Station Offices, Station Road	54.1	30.5	19.8
(4-9) 1-3 Erconwald Street	49.8	29.1	18.4
(4-10) 3 Victor Road	51.8	30.1	19.0
(4-11) 1 Wulfstan Street	49.8	29.1	18.4
(4-12) 2 Victoria Terrace	57.9	31.8	19.1
(4-13) 63A-63C Station Road	54.1	30.5	19.8
(4-14) 4 Manor Parade	54.1	30.5	19.8
(4-15) 2A St. John'S Hill	56.2	32.8	20.5
(4-16) 84 Shaftesbury Gardens	57.9	31.8	19.1
(4-17) Cabin Cafe, Scrubs Lane	51.8	30.1	19.0
(4-18) Holbrook House, Victoria Road	61.2	33.4	20.9
(4-19) 116 Wales Farm Road	61.2	33.4	20.9
(4-20) 5 Portal Way	61.2	33.4	20.9
(4-21) 3 Portal Way	61.2	33.4	20.9
(4-22) 133 Barnet Lane	28.7	18.5	16.5
(4-23) 2 Wells House Road	49.8	29.1	18.4
(4-24) 174A Lavender Hill	56.2	32.8	20.5
(4-41) Burlington Danes School, Wood Lane	62.8	35.1	21.7
(4-42) 235A Scrubs Lane	62.8	35.1	21.7
(4-43) 1B Woodmans Mews	62.8	35.1	21.7
(4-44) 235 Scrubs Lane	48.1	28.5	18.6
(4-45) The Production Offices, Old Oak Lane	57.9	31.8	19.1
(4-46) 76 Shaftesbury Gardens	57.9	31.8	19.1
(4-47) 98 Shaftesbury Gardens	57.9	31.8	19.1
(4-48) 3 Shaftesbury Gardens	57.9	31.8	19.1
(4-49) 4 Midland Terrace	57.9	31.8	19.1

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	**NO2**	**PM10**
(4-50) 152 Victoria Road	61.2	33.4	20.9
(4-51) Ebbett Court, Victoria Road	61.2	33.4	20.9
(4-52) Poulton Court, Victoria Road	61.2	33.4	20.9
(4-53) 1 Park Royal Road	61.2	33.4	20.9
(4-54) Trentham Court, Victoria Road	61.2	33.4	20.9
(4-55) 96 Wales Farm Road	61.2	33.4	20.9
(4-65) Cunningham Court, Edgware Road	58.3	33.1	20.2
(4-66) 453 Edgware Road	58.3	33.1	20.2
(4-67) 379 Edgware Road	58.3	33.1	20.2
(4-68) 283 Edgware Road	75.1	40.0	21.9

Design Manual for Roads and Bridges model results

5.3.7 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the Environmental Protection UK (EPUK) methodology[38].

Table 12: Summary of DMRB annual mean NO_2 results (construction phase)

Receptor	NO_2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme[39]			
4-1	63.7	49.7	51.5	1.8	Small	Slight adverse
4-2	51.0	42.0	42.7	0.7	Small	Slight adverse
4-3	57.0	46.7	47.4	0.8	Small	Slight adverse
4-4	38.3	32.6	32.6	0.0	Imperceptible	Negligible
4-5	59.9	49.7	50.2	0.5	Small	Slight adverse
4-6	35.6	30.2	30.2	0.0	Imperceptible	Negligible
4-7	49.0	41.7	42.7	1.0	Small	Slight adverse
4-8	53.5	43.6	43.6	0.0	Imperceptible	Negligible
4-9	46.1	38.5	38.5	0.0	Imperceptible	Negligible
4-10	51.9	41.7	42.5	0.8	Small	Slight adverse
4-11	43.6	36.5	36.6	0.1	Imperceptible	Negligible
4-12	55.6	46.9	48.5	1.6	Small	Slight adverse
4-13	50.3	41.9	41.9	0.0	Imperceptible	Negligible
4-14	63.0	50.8	50.7	0.0	Imperceptible	Negligible

[38] Environmental Protection UK (EPUK), (2010), *Development Control: Planning for Air Quality*
[39] Concentrations presented represent the highest of the test scenarios

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme[39]			
4-15	63.3	50.6	51.1	0.5	Small	Slight adverse
4-16	54.0	46.0	50.3	4.4	Large	Substantial adverse
4-17	52.1	42.0	43.3	1.4	Small	Slight adverse
4-18	43.6	37.0	38.5	1.5	Small	Slight adverse
4-19	62.7	52.0	55.4	3.4	Medium	Moderate adverse
4-20	88.6	75.0	76.6	1.6	Small	Slight adverse
4-21	82.9	70.2	72.0	1.8	Small	Slight adverse
4-22	31.2	25.0	27.4	2.4	Medium	Negligible
4-23	37.8	31.9	32.3	0.5	Small	Negligible
4-24	61.0	51.5	52.2	0.7	Small	Slight adverse

Table 13: Summary of DMRB annual mean PM10 results (construction phase)

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-1	23.8	22.4	22.8	0.4	Imperceptible	Negligible
4-2	21.2	20.8	20.9	0.1	Imperceptible	Negligible
4-3	24.7	24.1	24.2	0.2	Imperceptible	Negligible
4-4	19.1	19.0	19.0	0.0	Imperceptible	Negligible
4-5	25.7	24.9	25.1	0.2	Imperceptible	Negligible

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-6	18.7	18.7	18.7	0.0	Imperceptible	Negligible
4-7	21.3	21.0	21.0	0.1	Imperceptible	Negligible
4-8	22.8	22.1	22.1	0.0	Imperceptible	Negligible
4-9	19.7	19.5	19.5	0.0	Imperceptible	Negligible
4-10	21.9	21.3	21.4	0.2	Imperceptible	Negligible
4-11	19.8	19.6	19.6	0.0	Imperceptible	Negligible
4-12	22.0	21.6	21.7	0.1	Imperceptible	Negligible
4-13	23.1	22.4	22.4	0.0	Imperceptible	Negligible
4-14	23.2	22.3	22.3	0.0	Imperceptible	Negligible
4-15	25.2	24.2	24.4	0.1	Imperceptible	Negligible
4-16	21.7	21.3	21.6	0.3	Imperceptible	Negligible
4-17	21.9	21.3	21.6	0.3	Imperceptible	Negligible
4-18	22.0	21.8	22.0	0.2	Imperceptible	Negligible
4-19	24.2	23.7	24.0	0.3	Imperceptible	Negligible
4-20	30.7	29.4	29.5	0.2	Imperceptible	Negligible
4-21	29.4	28.2	28.4	0.2	Imperceptible	Negligible
4-22	18.3	18.1	18.2	0.1	Imperceptible	Negligible
4-23	19.0	18.9	19.0	0.0	Imperceptible	Negligible
4-24	25.9	25.2	25.4	0.1	Imperceptible	Negligible

5.3.8 Additional receptors identified from the DMRB congested situation assessment as moderate or substantial adverse, which were not identified as such in the main DMRB assessment, are shown in Table 14.

Table 14: Summary of DMRB annual mean NO2 results for DMRB congested situation assessment not identified by main DMRB assessment (construction phase)

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-12	-	53.1	55.5	2.4	Medium	Moderate adverse
4-18	-	41.3	44.4	3.1	Medium	Moderate adverse

Detailed modelling results

5.3.9 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the EPUK methodology[38]. Results presented correspond to the greatest impact at each receptor from the construction traffic scenarios assessed.

Table 15: Summary of ADMS-Roads annual mean NO2 results (construction phase)

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-12	67.9	61.7	66.0	4.3	Large	Substantial adverse
4-16	63.3	58.2	63.7	5.6	Large	Substantial adverse
4-18	58.4	54.1	55.9	1.8	Small	Slight adverse
4-19	73.7	66.3	69.8	3.5	Medium	Moderate adverse
4-41	61.5	57.5	58.1	0.7	Small	Slight adverse
4-42	73.9	65.6	67.5	1.9	Small	Slight adverse

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-43	58.4	54.6	55.3	0.6	Small	Slight adverse
4-44	62.9	54.6	56.4	1.8	Small	Slight adverse
4-45	65.4	59.4	61.7	2.3	Medium	Moderate adverse
4-46	55.2	51.5	55.1	3.5	Medium	Moderate adverse
4-47	56.0	52.1	54.4	2.4	Medium	Moderate adverse
4-48	54.2	50.7	53.9	3.2	Medium	Moderate adverse
4-49	49.9	47.3	48.9	1.7	Small	Slight adverse
4-50	57.1	53.1	54.2	1.2	Small	Slight adverse
4-51	57.9	53.6	54.3	0.8	Small	Slight adverse
4-52	63.9	58.2	59.8	1.6	Small	Slight adverse
4-53	76.1	68.1	69.1	0.9	Small	Slight adverse
4-54	71.1	63.4	65.0	1.6	Small	Slight adverse
4-55	71.5	64.4	67.3	2.9	Medium	Moderate adverse
4-65	62.8	52.3	53.9	1.7	Small	Slight adverse
4-66	66.4	55.4	57.6	2.2	Medium	Moderate adverse
4-67	64.5	53.9	56.2	2.3	Medium	Moderate adverse
4-68	84.7	71.3	74.0	2.7	Medium	Moderate adverse

Table 16: Summary of ADMS-Roads annual mean PM10 results (construction phase)

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-12	24.6	22.6	23.0	0.4	Imperceptible	Negligible
4-16	23.7	21.9	22.4	0.5	Small	Negligible
4-18	24.1	22.4	22.6	0.2	Imperceptible	Negligible
4-19	26.3	24.2	24.6	0.3	Imperceptible	Negligible
4-41	25.2	23.4	23.6	0.2	Imperceptible	Negligible
4-42	28.1	25.6	26.2	0.6	Small	Negligible
4-43	24.8	23.0	23.1	0.2	Imperceptible	Negligible
4-44	24.1	22.0	22.5	0.5	Small	Negligible
4-45	24.3	22.4	22.6	0.2	Imperceptible	Negligible
4-46	22.3	20.7	21.0	0.3	Imperceptible	Negligible
4-47	22.2	20.6	20.8	0.2	Imperceptible	Negligible
4-48	22.2	20.6	20.9	0.3	Imperceptible	Negligible
4-49	21.5	20.0	20.2	0.2	Imperceptible	Negligible
4-50	23.8	22.1	22.2	0.1	Imperceptible	Negligible
4-51	23.8	22.2	22.2	0.1	Imperceptible	Negligible
4-52	24.8	23.0	23.2	0.2	Imperceptible	Negligible
4-53	27.3	25.3	25.4	0.1	Imperceptible	Negligible
4-54	25.7	23.6	23.8	0.2	Imperceptible	Negligible

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-55	25.9	23.9	24.1	0.2	Imperceptible	Negligible
4-65	24.0	22.4	22.5	0.1	Imperceptible	Negligible
4-66	24.6	23.0	23.1	0.1	Imperceptible	Negligible
4-67	24.3	22.8	23.0	0.1	Imperceptible	Negligible
4-68	28.8	26.6	26.8	0.2	Imperceptible	Negligible

Table 17: Summary of ADMS-Roads 24-hour mean PM10 results (construction phase)

Receptor	Number of days exceeding PM10 24-hour standard			Change in days	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-12	11.5	7.4	8.1	0.7	Imperceptible	Negligible
4-16	9.5	6.2	7.0	0.8	Imperceptible	Negligible
4-18	10.4	7.1	7.4	0.3	Imperceptible	Negligible
4-19	15.8	10.6	11.4	0.8	Imperceptible	Negligible
4-41	13.0	8.9	9.2	0.4	Imperceptible	Negligible
4-42	21.0	14.0	15.5	1.5	Small	Negligible
4-43	11.9	8.1	8.4	0.3	Imperceptible	Negligible
4-44	10.3	6.3	7.1	0.9	Imperceptible	Negligible
4-45	10.9	7.0	7.4	0.4	Imperceptible	Negligible
4-46	6.7	4.3	4.7	0.4	Imperceptible	Negligible

Receptor	Number of days exceeding PM10 24-hour standard			Change in days	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
4-47	6.6	4.2	4.4	0.2	Imperceptible	Negligible
4-48	6.6	4.2	4.6	0.4	Imperceptible	Negligible
4-49	5.4	3.4	3.6	0.2	Imperceptible	Negligible
4-50	9.6	6.5	6.7	0.2	Imperceptible	Negligible
4-51	9.7	6.6	6.7	0.1	Imperceptible	Negligible
4-52	11.9	8.1	8.4	0.3	Imperceptible	Negligible
4-53	18.4	13.0	13.3	0.3	Imperceptible	Negligible
4-54	14.0	9.3	9.6	0.4	Imperceptible	Negligible
4-55	14.5	9.9	10.4	0.5	Imperceptible	Negligible
4-65	10.0	6.9	7.1	0.2	Imperceptible	Negligible
4-66	11.5	8.1	8.4	0.3	Imperceptible	Negligible
4-67	10.9	7.8	8.1	0.3	Imperceptible	Negligible
4-68	23.2	16.5	17.1	0.6	Imperceptible	Negligible

Assessment of significance

5.3.10 The significance of the impacts on air quality from construction traffic associated with the Proposed Scheme has been assessed in accordance with the EPUK methodology[38]. AQMAs cover the study area, and pollution levels exceed air quality standards in many locations, particularly along major roads.

5.3.11 The DMRB assessment identified a number of receptors where there may be moderate or substantial adverse air quality impacts from traffic during the construction phase.

5.3.12 The ADMS-Roads assessment predicted that there will be numerous locations where air quality standards are exceeded, with and without the Proposed Scheme, where concentrations of NO2 and PM10 increase with the Proposed Scheme.

5.3.13 NO2 impacts during the construction phase are predicted to be substantial adverse at receptors on:

- Shaftesbury Gardens, at the facade closest to Victoria Road; and
- Victoria Terrace, Victoria Road

5.3.14 NO2 impacts during the construction phase are predicted to be moderate adverse at receptors on:

- Shaftesbury Gardens, at the facades closest to Victoria Road and Old Oak Common Lane (multiple receptors);
- Wales Farm Road (two receptors);
- A4000 Old Oak Lane (two receptors); and
- A5 Edgware Road, between the A40 Marylebone Flyover and Blomfield Road (multiple receptors).

5.3.15 PM10 impacts (in relation to the24-hour standard) during the construction phase are predicted to be negligible.

5.3.16 The NO2 impacts will give rise to significant effects. These will, however, be of limited spatial extent, close to roads affected by changes in traffic.

5.4 Operational traffic model

5.4.1 Operational traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. The scenario assessed is based on maximum traffic on affected roads during the opening year of the Proposed Scheme.

Receptors assessed

5.4.2 For all road links where DMRB criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for assessment. These included locations representative of highest concentrations along the roads, including closest to junctions or to the road itself. Receptors assessed are presented in Map AQ-01-004 (Volume 5, Air Quality Map Book).

Table 18: Modelled receptors (operational phase)

Receptor	Description/location	Ordnance Survey coordinates
4-4	245 Wulfstan Street	521521, 181541
4-6	63 Wells House Road	521296, 181890
4-9	1-3 Erconwald Street	521566, 181076
4-12	2 Victoria Terrace	521445, 182474
4-19	116 Wales Farm Road	520887, 181753
4-20	5 Portal Way	520585, 181712
4-23	2 Wells House Road	521287, 181987
4-25	4 Midland Terrace	521243, 182282
4-26	9 Station Road	521609, 183288
4-27	1 Wulfstan Street	521985, 181094
4-28	3 Portal Way	520665, 181524
4-29	24 Wood Lane	523115, 181278
4-30	167 Wells House Road	521306, 182090
4-31	3 School Road	521043, 182114
4-32	172-174 Uxbridge Road	523303, 179974
4-33	238 Old Oak Common Lane	521476, 181483
4-34	37 Old Oak Lane	521589, 182688
4-35	West Shopping Centre, Shepherds Bush Green	523610, 179814
4-36	12 Wulfstan Street	522000, 181135
4-37	60A Wood Lane	523258, 180851
4-38	140 Victoria Road	520911, 181836
4-39	76 Wood Lane	523218, 181000
4-40	61A-61C Station Road	521720, 183032
4-56	50 Old Oak Lane	521569, 182686
4-57	49 Old Oak Lane	521553, 182634
4-58	9 Goodhall Street	521527, 182681
4-59	43 Old Oak Lane	521575, 182664
4-60	84 Shaftesbury Gardens	521415, 182456
4-61	The Production Offices, Old Oak Lane	521471, 182511
4-62	22 Old Oak Lane	521622, 182763
4-63	66 Old Oak Lane	521604, 182770
4-64	29 Old Oak Lane	521605, 182728

Background concentrations

5.4.3 The background concentrations used in the assessment are shown in Table 19 and

5.4.4 Table 20, taken from the Defra maps[28].

Table 19: Background 2012 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-4) 245 Wulfstan Street	60.9	34.0	19.6
(4-6) 63 Wells House Road	60.9	34.0	19.6
(4-9) 1-3 Erconwald Street	60.9	34.0	19.6
(4-12) 2 Victoria Terrace	69.4	36.2	20.4
(4-19) 116 Wales Farm Road	74.6	38.6	22.3
(4-20) 5 Portal Way	74.6	38.6	22.3
(4-23) 2 Wells House Road	60.9	34.0	19.6
(4-25) 4 Midland Terrace	69.4	36.2	20.4
(4-26) 9 Station Road	67.0	35.7	21.1
(4-27) 1 Wulfstan Street	60.9	34.0	19.6
(4-28) 3 Portal Way	74.6	38.6	22.3
(4-29) 24 Wood Lane	80.0	42.4	23.1
(4-30) 167 Wells House Road	69.4	36.2	20.4
(4-31) 3 School Road	69.4	36.2	20.4
(4-32) 172-174 Uxbridge Road	77.7	42.0	22.7
(4-33) 238 Old Oak Common Lane	60.9	34.0	19.6
(4-34) 37 Old Oak Lane	69.4	36.2	20.4
(4-35) West Shopping Centre, Shepherds Bush Green	77.7	42.0	22.7
(4-36) 12 Wulfstan Street	59.2	33.5	19.8
(4-37) 60A Wood Lane	72.9	39.4	22.3
(4-38) 140 Victoria Road	74.6	38.6	22.3
(4-39) 76 Wood Lane	80.0	42.4	23.1
(4-40) 61A-61C Station Road	67.0	35.7	21.1
(4-56) 50 Old Oak Lane	69.4	36.2	20.4
(4-57) 49 Old Oak Lane	69.4	36.2	20.4
(4-58) 9 Goodhall Street	69.4	36.2	20.4
(4-59) 43 Old Oak Lane	69.4	36.2	20.4

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-60) 84 Shaftesbury Gardens	69.4	36.2	20.4
(4-61) The Production Offices, Old Oak Lane	69.4	36.2	20.4
(4-62) 22 Old Oak Lane	69.4	36.2	20.4
(4-63) 66 Old Oak Lane	69.4	36.2	20.4
(4-64) 29 Old Oak Lane	69.4	36.2	20.4

Table 20: Background 2026 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-4) 245 Wulfstan Street	38.5	23.7	17.6
(4-6) 63 Wells House Road	38.5	23.7	17.6
(4-9) 1-3 Erconwald Street	38.5	23.7	17.6
(4-12) 2 Victoria Terrace	45.8	26.5	18.2
(4-19) 116 Wales Farm Road	46.1	26.8	19.9
(4-20) 5 Portal Way	46.1	26.8	19.9
(4-23) 2 Wells House Road	38.5	23.7	17.6
(4-25) 4 Midland Terrace	45.8	26.5	18.2
(4-26) 9 Station Road	41.2	24.6	19.0
(4-27) 1 Wulfstan Street	38.5	23.7	17.6
(4-28) 3 Portal Way	46.1	26.8	19.9
(4-29) 24 Wood Lane	42.4	25.7	20.6
(4-30) 167 Wells House Road	45.8	26.5	18.2
(4-31) 3 School Road	45.8	26.5	18.2
(4-32) 172-174 Uxbridge Road	43.3	26.6	20.4
(4-33) 238 Old Oak Common Lane	38.5	23.7	17.6
(4-34) 37 Old Oak Lane	45.8	26.5	18.2
(4-35) West Shopping Centre, Shepherds Bush Green	43.3	26.6	20.4
(4-36) 12 Wulfstan Street	35.8	22.4	17.7
(4-37) 60A Wood Lane	41.9	25.4	20.0
(4-38) 140 Victoria Road	46.1	26.8	19.9
(4-39) 76 Wood Lane	42.4	25.7	20.6
(4-40) 61A-61C Station Road	41.2	24.6	19.0
(4-56) 50 Old Oak Lane	45.8	26.5	18.2

Receptor (or zone of receptors)	Concentrations (µg/m^3)		
	NOx	NO2	PM10
(4-57) 49 Old Oak Lane	45.8	26.5	18.2
(4-58) 9 Goodhall Street	45.8	26.5	18.2
(4-59) 43 Old Oak Lane	45.8	26.5	18.2
(4-60) 84 Shaftesbury Gardens	45.8	26.5	18.2
(4-61) The Production Offices, Old Oak Lane	45.8	26.5	18.2
(4-62) 22 Old Oak Lane	45.8	26.5	18.2
(4-63) 66 Old Oak Lane	45.8	26.5	18.2
(4-64) 29 Old Oak Lane	45.8	26.5	18.2

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5.4.5 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the EPUK methodology[38].

Table 21: Summary of DMRB annual mean NO2 results (operational phase)

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-4	38.3	25.3	25.3	0.0	Imperceptible	Negligible
4-6	35.6	24.0	24.3	0.3	Imperceptible	Negligible
4-9	47.3	28.1	30.3	2.2	Medium	Slight adverse
4-12	55.7	34.0	37.3	3.3	Medium	Moderate adverse
4-19	60.3	35.2	35.8	0.6	Small	Negligible
4-20	88.5	49.1	49.6	0.4	Small	Slight adverse
4-23	35.0	23.9	24.3	0.4	Imperceptible	Negligible
4-25	42.6	29.0	29.1	0.1	Imperceptible	Negligible
4-26	62.3	34.1	33.7	-0.4	Small	Negligible
4-27	43.7	26.7	27.4	0.7	Small	Negligible
4-28	82.8	46.2	46.8	0.5	Small	Slight adverse
4-29	61.5	33.0	33.9	1.0	Small	Negligible
4-30	45.3	29.5	31.9	2.3	Medium	Slight adverse
4-31	43.2	29.0	29.3	0.3	Imperceptible	Negligible
4-32	58.1	32.6	32.9	0.3	Imperceptible	Negligible
4-33	39.1	24.9	25.7	0.8	Small	Negligible
4-34	55.0	33.9	35.9	2.0	Small	Negligible
4-35	48.3	27.7	31.2	3.4	Medium	Slight adverse
4-36	40.3	25.1	25.0	0.0	Imperceptible	Negligible
4-37	56.1	31.3	32.1	0.8	Small	Negligible
4-38	45.6	29.5	29.7	0.2	Imperceptible	Negligible
4-39	53.9	29.8	30.5	0.8	Small	Negligible
4-40	54.8	31.5	30.6	-0.9	Small	Negligible

Table 22: Summary of DMRB annual mean PM10 results (operational phase)

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-4	20.2	18.2	18.1	0.0	Imperceptible	Negligible
4-6	19.9	17.9	17.9	0.0	Imperceptible	Negligible
4-9	21.0	18.6	18.8	0.3	Imperceptible	Negligible
4-12	23.3	20.5	20.7	0.2	Imperceptible	Negligible
4-19	25.1	22.3	22.4	0.2	Imperceptible	Negligible
4-20	31.9	27.5	27.7	0.1	Imperceptible	Negligible
4-23	19.8	17.8	17.8	0.0	Imperceptible	Negligible
4-25	21.4	19.2	19.3	0.1	Imperceptible	Negligible
4-26	24.2	20.9	20.8	-0.1	Imperceptible	Negligible
4-27	21.0	18.7	18.8	0.2	Imperceptible	Negligible
4-28	30.6	26.6	26.7	0.1	Imperceptible	Negligible
4-29	26.9	23.5	23.7	0.2	Imperceptible	Negligible
4-30	21.6	19.3	19.3	0.0	Imperceptible	Negligible
4-31	21.5	19.3	19.4	0.1	Imperceptible	Negligible
4-32	25.0	22.4	22.4	0.1	Imperceptible	Negligible
4-33	20.2	18.0	18.2	0.1	Imperceptible	Negligible
4-34	23.7	20.8	20.9	0.1	Imperceptible	Negligible
4-35	23.4	21.1	21.2	0.1	Imperceptible	Negligible
4-36	20.7	18.5	18.5	0.0	Imperceptible	Negligible
4-37	25.0	21.8	21.8	0.1	Imperceptible	Negligible
4-38	23.2	20.8	20.9	0.1	Imperceptible	Negligible
4-39	25.4	22.3	22.4	0.1	Imperceptible	Negligible
4-40	24.0	21.0	20.8	-0.2	Imperceptible	Negligible

5.4.6 An additional receptor identified from the DMRB congested situation assessment as moderate or substantial adverse, which was not identified as such in the main DMRB assessment, is shown in Table 23.

Table 23: Summary of DMRB annual mean NO2 results for congested situation assessment not identified by DMRB assessment (operational phase)

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-34	55.0	38.8	42.0	3.3	Medium	Moderate adverse

Detailed modelling results

5.4.7 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the EPUK methodology[38].

Table 24: Summary of ADMS-Roads annual mean NO2 results (operational phase)

Receptor	NO2 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-12	67.9	39.6	42.6	3.0	Medium	Moderate adverse
4-34	62.6	37.1	38.5	1.4	Small	Slight adverse
4-56	61.4	36.5	38.0	1.5	Small	Slight adverse
4-57	66.2	38.6	42.5	3.9	Medium	Moderate adverse
4-58	50.0	31.7	32.3	0.6	Small	Negligible
4-59	66.9	39.0	42.4	3.4	Medium	Moderate adverse
4-60	63.3	37.9	39.5	1.7	Small	Slight adverse
4-61	65.4	38.3	41.9	3.6	Medium	Moderate adverse
4-62	62.1	36.9	37.7	0.9	Small	Slight adverse
4-63	58.1	35.0	35.7	0.7	Small	Negligible
4-64	62.8	37.2	38.2	1.0	Small	Slight adverse

Table 25: Summary of ADMS-Roads annual mean PM10 results (operational phase)

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-12	24.6	21.4	21.6	0.2	Imperceptible	Negligible
4-34	24.0	21.0	21.1	0.1	Imperceptible	Negligible
4-56	23.7	20.8	20.9	0.1	Imperceptible	Negligible
4-57	24.6	21.5	21.6	0.1	Imperceptible	Negligible
4-58	21.5	19.1	19.1	0.0	Imperceptible	Negligible

Receptor	PM10 concentrations (µg/m^3)			Change in concentrations (µg/m^3)	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-59	24.8	21.6	21.7	0.1	Imperceptible	Negligible
4-60	23.7	20.9	21.1	0.2	Imperceptible	Negligible
4-61	24.3	21.2	21.4	0.1	Imperceptible	Negligible
4-62	23.9	21.0	21.1	0.1	Imperceptible	Negligible
4-63	23.0	20.3	20.4	0.1	Imperceptible	Negligible
4-64	24.1	21.1	21.2	0.1	Imperceptible	Negligible

Table 26: Summary of ADMS-Roads 24-hour mean PM10 results (operational phase)

Receptor	Number of days exceeding PM10 24-hour standard			Change in days	Magnitude of change	Impact descriptor
	2012 baseline	2026 without Proposed Scheme	2026 with Proposed Scheme			
4-12	11.5	5.3	5.6	0.4	Imperceptible	Negligible
4-34	10.1	4.8	4.9	0.1	Imperceptible	Negligible
4-56	9.5	4.4	4.5	0.1	Imperceptible	Negligible
4-57	11.4	5.4	5.6	0.2	Imperceptible	Negligible
4-58	5.4	2.3	2.4	0.0	Imperceptible	Negligible
4-59	11.8	5.7	5.8	0.2	Imperceptible	Negligible
4-60	9.5	4.6	4.8	0.3	Imperceptible	Negligible
4-61	10.9	5.1	5.3	0.2	Imperceptible	Negligible
4-62	9.9	4.7	4.8	0.1	Imperceptible	Negligible
4-63	8.2	3.8	3.9	0.1	Imperceptible	Negligible
4-64	10.2	4.9	5.0	0.1	Imperceptible	Negligible

Assessment of significance

5.4.8 The significance of the impacts on air quality from operational traffic associated with the Proposed Scheme has been assessed in accordance with the EPUK methodology[38]. AQMAs cover the entire study area and pollution levels exceed air quality standards in many locations particularly along major roads.

5.4.9 The DMRB assessment identified two receptors along Old Oak Lane where there may be moderate adverse NO2 impacts from traffic during the operational phase. The ADMS-Roads assessment predicted that there will be moderate adverse impacts from

traffic during the operational phase at receptors along the A4000 Old Oak Lane, between Atlas Road and Channel Gate Road.

5.4.10 PM10 impacts are predicted to be negligible at receptors in the study area during operation.

5.4.11 The NO_2 impacts will give rise to significant effects. These are limited in spatial extent to properties along Old Oak Lane, between Atlas Road and Channel Gate Road.

6 Air quality assessment - railhead

6.1 Introduction

6.1.1 The railhead at Old Oak Common will have additional diesel-powered train movements during the construction phase.

6.1.2 The methodology for assessing impacts from railheads is set out in the Scope and Methodology Report (SMR, Volume 5: Appendix CT-001-000/1) and is based on Defra's Local Air Quality Management Technical Guidance. This identifies locations with relevant public exposure where there is risk of exceedance of the annual mean air quality standard for NO2. Such locations are within 30m of railway tracks, where the background annual mean NO2 concentration is above 25µg/m^3. As the railhead at Old Oak Common meets these criteria, a more detailed analysis has been undertaken to assess this impacts of these additional train movements.

6.2 Assessment approach

6.2.1 The peak use of railhead is predicted to be 22 locomotive movements per day over 11 months. These are anticipated to be Class 66 locomotives and operate 24 hours per day. During other construction phases, there will be fewer locomotive movements and any air quality impact will be smaller.

6.2.2 The emission factors used in this assessment are for Class 66 locomotives (in g NOx/km). These are taken from an emission model built for the Strategic Rail Authority in 2001[40]. Although turnover within the locomotive fleet is much slower than for road transport, it is likely that emissions from Class 66 locomotives will have reduced between 2001 and 2017, especially in light of recent European legislation setting emission standards for new locomotives. This is therefore a worst case assessment.

6.2.3 There are eight residential properties within 30m of the railhead, on Goodhall Street and Stephenson Street. The closest property is 16 m from the closest rail track with additional locomotives associated with this scheme. Although the 22 locomotive movements will occur across the railhead, a pessimistic approach has been taken, which assumes that all movements will occur on the track closest to the receptors. This is a worst case assessment and the actual impacts are likely to be lower than predicted here.

6.2.4 To assess the impact of the emissions from the locomotives using the railhead, the DMRB methodology has been used to estimate the concentrations at the receptor based on the predicted locomotive emissions. In the absence of robust data on the proportion of NOx emitted as NO2 for locomotives, the highest proportion in Defra's NOx to NO2 calculator[41] has been used.

[40] AEA Technology for the Strategic Rail Authority (2001), *Rail Emission Model*
[40] Highways Agency, (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*

[41] http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html

6.2.5 The input parameters are set out in Table 27.

Table 27: Model inputs for railhead locomotive emissions

Model input	Description
Number of locomotive movements	22 per day 0.9 per hour
Class 66 locomotive NOx emission factor	120g/km
Predicted emissions from railhead	110g/km/hr
Distance to closest receptor	16m
Predicted annual average background NOx concentration (2017)[42]	54.1µg/m^3
Predicted annual average background NO2 Concentration (2017)	30.5µg/m^3
Assumed proportion of NOx emitted as NO2	25%

Railhead air quality assessment results

Table 28: Summary of annual mean NO2 impact at nearest receptor from the railhead (construction phase)

Receptor	Change in NOx concentrations with Proposed Scheme (µg/m^3)	Change in NO2 concentrations with Proposed Scheme (µg/m^3)	EPUK magnitude of change	Total NO2 concentration compared to standard (40µg/m^3)	EPUK impact descriptor
Closest receptor to railhead	5.3	2.5	Medium increase	Below standard	Slight adverse

Assessment of significance

6.2.6 The significance of the impacts on air quality from railhead has been assessed in accordance with the EPUK methodology[38]. The additional locomotive movements associated with the peak use of the railhead are predicted to have a slight adverse impact on the receptors close by. This is based on a number of worst case assumptions and the actual impact is likely to be less. The effect on receptors will not be significant.

[42] Department for Environment, Food and Rural Affairs (Defra) (2012) Defra background maps 2017; http://laqm.defra.gov.uk/maps/maps2010.html; Accessed: September 2013.

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